REMARKS/ARGUMENTS

Reconsideration of the present application, as amended, is respectfully requested.

The August 17, 2004 Final Office Action and the Examiner's comments have been carefully considered. In response, claims 1 and 27 are amended, claims 25, 26 and 28 are cancelled, and remarks are set forth below in a sincere effort to place the present application in condition for allowance. The amendments are supported by the application as originally filed. Therefore, no new matter is added.

Inasmuch as the present Amendment raises no new issues for consideration, and, in any event, places the present application in condition for allowance or in better condition for consideration on appeal, its entry under the provisions of 37 CFR 1.116 is respectfully requested. Specifically, claim 1 is amended to include the subject matter of claims 25 and 26 and thus since claims 25 and 26 were previously considered by the Examiner, no new issues are raised.

INTERVIEW SUMMARY

The courtesies extended by Examiner Kao in a telephonic interview conducted on September 9, 2004 are gratefully

appreciated. In the interview, the invention was described and proposed changes to claim 1 to clarify the invention were discussed.

ALLOWABLE SUBJECT MATTER

The Examiner's indication that claims 18, 20 and 21 contain allowable subject matter is acknowledged and appreciated.

PRIOR ART REJECTIONS

In the Office Action, claims 1, 2, 4, 5, 7 and 22-28 are rejected under 35 USC 103(a) as being unpatentable over USP 3,952,201 (Hounsfield) in view of USP 5,482,042 (Fujita). Claims 6 and 8 are rejected under 35 USC 103(a) as being unpatentable over Hounsfield in view of Fujita and further in view of USP 4,547,892 (Richey et al.). Claim 9 is rejected under 35 USC 103(a) as being unpatentable over Hounsfield in view of Fujita and Richey et al. and further in view of USP 4,751,644 (Koka et al.). Claim 10 is rejected under 35 USC 103(a) as being unpatentable over Hounsfield in view of Fujita and Richey et al. and further in view of USP 4,878,499 (Suzuki et al.).

The Examiner's rejections are respectfully traversed on the grounds that the cited prior art does not disclose, teach or

suggest a method for acquiring a three-dimensional image data set of a moving organ of a body including all of the features now set forth in amended claim 1.

Claim 1 is amended to include the features of an X-ray cycle being defined as an cycle in which a plurality of X-ray positions are successively occupied including a common initial X-ray position and a common final X-ray position different than the initial X-ray position, a start of each X-ray cycle being controlled based on the motion signal to cause the forthcoming X-ray cycle to commence from the initial X-ray position at a different instant in the different phases of motion of the organ than any preceding X-ray cycles, and the X-ray cycles being completed by beginning each X-ray cycle with the X-ray device in the initial X-ray position, ending each X-ray cycle with the X-ray device in the final X-ray position, and then moving the X-ray device from the final X-ray position back to the initial X-ray position to begin a subsequent X-ray cycle in a time interval which allows the subsequent X-ray cycle to commence at a different phase of motion of the organ.

With reference to Fig. 4, each X-ray cycle commences with the X-ray device in a position designated P0 and ends with the X-ray device in a position designated P16. Prior to the start of

each X-ray cycle (after the first X-ray cycle), the motion signal is detected and the forthcoming X-ray cycle is started at a different instant in the different phases of motion than any preceding X-ray cycle. For example, once the first X-ray cycle is complete and the X-ray device is in the position P0, it is held in that position until a different instant in the motion phase, e.g., at the beginning of the high-motion phase when the initial X-ray cycle started at the beginning of the low-motion phase (see the specification at page 6, lines 11-25).

Accordingly, the start of each X-ray cycle (after the first X-ray cycle) depends on the motion signal being detected while the X-ray device is situated in the initial X-ray position immediately prior to beginning that X-ray cycle. Since the time interval for moving the X-ray device from the final X-ray position to the initial X-ray position may vary, it is not possible to predetermine the start of each X-ray cycle and thus, the start of each X-ray cycle depends on the motion signal being detected at that time.

Hounsfield describes an X-ray device having a scanner including an X-ray source 4 and X-ray detector 6 mounted on an annular turntable member 7 which rotates around a body 1 being examined. Irradiation of the body 1 occurs via operation of the

X-ray source 4 when the amplitude of the motion of the body 1 is below a threshold (see Figs. 2(a)-2(c)). Since the scanner does not obtain X-ray images from angular positions in which it is not operating during a first revolution of the member 7 about the body 1 (e.g., angular positions α-β in Fig. 2(c)), in a second revolution, the speed of a motor 8 which controls rotation of the member 7 may be adjusted so that the X-ray source 4 is active between angular positions α-β.

In contrast to the present claimed invention, Hounsfield does not disclose X-ray cycles which begin and end at common positions, which are different than one another, with the X-ray device being moved from the final position to the initial position to begin another X-ray cycle, and wherein the start of the next X-ray cycle is controlled based on the motion signal detected when considering when to start that X-ray cycle.

As shown in Figs. 2(a) and 2(c), each X-ray cycle is a complete revolution of the X-ray device from 0° to 360°. Thus, the initial position and final position are the same and there is no movement between successive X-ray cycles from the final position to the initial position. The Examiner considered the initial position at 0° and the final position at β° with movement of the x-ray device being from β° to 360°. However, this position

is traversed because the segment from β° to 360° is clearly part of the same X-ray revolution or cycle as the segment from 0° to β°, especially since the X-ray source is actually "on" in the first revolution in the segment from β° to 360° (see Figs. 2(b) and 2(c)).

Hounsfield also does not control the start of each X-ray cycle to cause the forthcoming X-ray cycle to begin at a different instant in the different phases of motion. Rather, in Hounsfield, the X-ray device rotates continuously through multiple X-ray cycles with only the speed of rotation varying for different X-ray cycles and the rotational speed of all of the required revolutions can be determined in advance of the first revolution.

This is problematic since Hounsfield cannot account for variations in the motion signal during the X-ray revolutions. That is, if the motion signal changes during the X-ray examination, Hounsfield cannot account for this change and the X-ray device will continue to rotate at the rotational speeds determined based on the motion signal detected prior to the beginning of the examination.

By contrast, since the invention detects the motion signal before beginning each X-ray cycle in order to determine when to

start the forthcoming X-ray cycle (e.g., when the X-ray device is in the initial X-ray position prior to starting the second X-ray cycle), it is able to start the forthcoming X-ray cycle at a different instant in the different phases of motion than the preceding X-ray cycles. The motion signal as it exists at the time the start of the forthcoming cycle is being determined is thus considered when starting the forthcoming cycle thereby greatly improving the certainty that the X-ray device will be active in the forthcoming cycle during different phases of motion than it was active in preceding x-ray cycles.

Fujita also does not disclose, teach or suggest controlling the start of multiple X-ray cycles based on a motion signal at a different instant in the different phases of motion of the organ.

In view of the foregoing, claim 1 is patentable over Hounsfield and Fujita when taken either alone under 35 USC §102 or in combination under 35 USC §103(a).

The other references of record do not close the gap between the present claimed invention as defined by claim 1 and Hounsfield in view of Fujita.

Therefore, claim 1 and claims 2, 4-10, 22-24 and 27 which are either directly or indirectly dependent thereon are

patentable over all of the references of record under 35 USC §102 as well as 35 USC §103.

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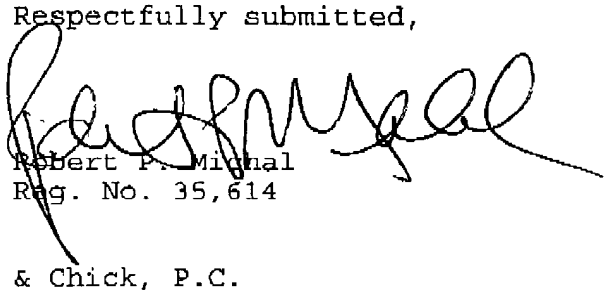
If the Examiner disagrees with any of the foregoing, the Examiner is respectfully requested to point out where there is support for a contrary view.

Entry of this Amendment under the provisions of 37 CFR 1.116, allowance of the claims, and the passing of the application to issue are respectfully solicited.

If the Examiner has any comments, questions, objections or recommendations, the Examiner is invited to telephone the undersigned at the telephone number given below for prompt action.

Respectfully submitted,



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September 22, 2004

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